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ANATOMY AND ART.

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BY

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ANATOMY AND ART.*

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The question whether art in its early development was at all aided by anatomy, and the further inquiry whether the aid of anatomy is of any real benefit to art, are not new questions. Critics and artists have expressed their opinions on one or the other side. Mr. Ruskin, with characteristic vehemence, has returned a decided negative to both questions. Writers on art, being human, are prone to repeat dogmatic rules, and so the assertion is very commonly made that the artist who proposes to represent the human form, whether in sculpture or in painting, must in part fit himself for his work at the dissecting table. It is the purpose of this address to endeavor to examine the matter from a historical point of view chiefly. The rise and progress of the study of anatomy, and its rapid advance by means of artistic illustrations after the invention of printing, considered in relation to art in its earlier age and its later development, will, perhaps, assist in an understanding of the subject.

While anatomy may be defined generally to be the study of an organized body, there are many recognized divisions of the subject, one only of which concerns the present inquiry. Artistic anatomy comprehends the whole external

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form of the body with the superficial veins of the skin and the muscles immediately under it. It must also be understood to include certain external pathological conditions, for the leper and the demoniac, the lame and the blind, are frequently introduced in early Christian art and in the paintings of subsequent times. A better term than artistic anatomy, more comprehensive as implying form as well as structure, would be *artistic morphology*.

It must not be supposed that artistic anatomy, or morphology, implies only the study of the dead body. The flaccid inexpressive muscles can teach little except their mechanical attachments and relations. It is function as well as structure—physiology as well as anatomy—which is of as much, or of more, importance to the artist. Some of the differences of opinion on the question at issue are doubtless due to the neglect of this distinction. Another vital point of artistic morphology is the study of the modifications which are seen in external form from the influence of sex, age, and race. Holman Hunt made a long sojourn in Judea before painting his famous picture of Christ among the Doctors. Nevertheless, in spite of his close observance, a young lady made this comment: "It is very fine, but one can see that the painter was not acquainted with the distinctive character of the tribe of Judah; he has given to his doctors the flat feet of the tribe of Reuben, whereas the men of Judah had highly arched insteps."

Occupation, too, puts its distinctive mark upon the human figure, and certain joints or muscles become permanently enlarged or disfigured.

It has been already said that the artist should know something of pathology before attempting to paint the effect of disease. In like manner, he must learn how the muscles can assume a most pathetic expressiveness when death is imminent from a mortal injury. It has been objected to that exquisite statue, *The Dying Gladiator*, that the pose is somewhat theatrical—that the dying man should be prone or supine on the ground. Not at all—the two-edged Roman

sword has pierced his chest, the lungs are filling with his life's blood, and with shoulders drawn forward he leans upon his arm, gasping for breath. He may be thinking of "his young barbarians," and of "their Dacian mother," far away, but his position in the death agony is strictly natural.

There are those who regard with some degree of timid dread the introduction of science into art. Art, they affirm, is conventional and full of exaggerations, and has nothing in common with the precision of science. A great master who was not only painter, but sculptor, architect, engineer, Leonardo da Vinci, has clearly defined this matter. "In a general way," he says, "it is the office of science to distinguish what is impossible from what is possible. Imagination left to herself would revel in unrealizable dreams. Science controls her by showing what cannot be. It does not follow that science includes the principle of art, but that we must study science either before or at the same time with art to learn in what limits the latter is to be confined."

No doubt a knowledge of anatomy cannot make the artist, any more than study and training can make the poet—the divine vocation must be there—but spontaneity in either is a mere euphemism for indolence, and the world is very likely to pass by such work. Art is serious, and is not to be regarded as a pastime merely.

The critic in art would, in like manner, be somewhat assisted by a knowledge of anatomy, for patient study must be his dependence, and not a mere reliance on taste. A susceptibility of pleasure at sight of a work of art, constituting *taste*, is popularly supposed to be a sixth sense, and it has been satirically said that every man believes himself to be possessed of it. This, after all, is not surprising. A man will readily acknowledge ignorance of what it obviously requires time and labor to acquire, but not to possess an inborn sense of taste would be to renounce a birthright and to take rank with the outcasts of Nature! Vanity is perhaps at the bottom of it all:

"Some demon whispers 'Strephon, have a taste.'"

Whether in art or literature, cultivation of the critical faculty demands long study, close observation, and familiarity with the best masters. It is not to the point to say that the critic cannot paint the picture, carve the statue, build the temple, or write the poem. If he could, there would be an end of criticism, and the world would be more full than now of crudities in art.

It may be boldly said that a close study of the anatomy in a great work of art is a part of a fundamental error in art criticism, namely, the too minute consideration of the process of production rather than the appreciation of the life and harmony of the whole. The *technique* must not deprive us of the artistic illusion. It is in archaic art that we are impressed with the building up of the body. Flexibility is wanting, and it is in high art only that we find dynamics in place of statics.

The influence of anatomy is of more importance to sculpture than to painting. In the latter a surface only is presented, while in a statue the whole figure must be displayed. Clothing, which exhibits the most exquisite effects of the painter's art, is stiff and ungainly in the dull marble, and has always been discarded as much as possible by the sculptor. Herr Teufelsdröckh could never have thought out his philosophy of clothes in a gallery of sculpture.

Artistic anatomy in a master hand greatly assists the understanding of the story intended to be portrayed. It was said of a very famous picture that there was a story in every joint of the fingers of the principal figure. If a story is to be told, however, it should be recounted in poetry or prose. It has been shrewdly observed that if the famous Angelus of Millet were to be looked at hundreds of years hence, when church bells had long since been disused and were forgotten—if that blessed time should ever arrive—no comprehension of the meaning of the painting would be possible.

It is a noteworthy fact that the most persistent advocates of the essentialness of anatomy to art speak only, as a rule

of the human figure, and yet the argument must apply equally to animals. Can we suppose that either of the three Rhodian sculptors ever dissected a python to enable him to carve the graceful folds of the two mighty serpents which are crushing the agonized Laocoon and his two hapless sons? Did Barye obtain his knowledge of the musculature of the tigers and elephants of his wonderful groups from the dissecting table? Look at Meissonier's famous painting of the Portrait of the Sergeant. The dog who is looking up at the martial pose of the soldier with such a diverting expression of wonder is a mere mass of wiry hair, with hardly a suggestion of bone or muscle. External form only is visible. A study of the works of the great animal painters and sculptors will show the impossibility of dissection having been a prerequisite to their art.

A famous statuary, whose horses are especially admirable, tells me that he never knew an artist much given to the study of anatomy who did not spoil his work by over-minute anatomical detail. On the other hand, he observed, a certain knowledge of the anatomy of the horse from drawings or models is desirable, or the artist may copy a wind-gall for a muscle!

Ruskin, in his lecture on the relation of art to organized form, with some exaggeration pronounces anatomy to be not only useless to the artist, but to be a positive injury. He instances the works of Albert Dürer, whose knowledge of anatomy was so minute and extensive that he was never able to produce a beautiful human face; the bones, of which he knew too much, were in his way.

There is nothing to indicate that oriental nations, or the ancient Greeks, knew anything of muscular anatomy, except from external form. Their warlike pursuits made them well acquainted with the viscera through the effect of wounds. The names of organs and regions of the body mentioned by Homer, and which have mostly come down to us through Hippocratic writers, number over one hundred and forty according to Daremberg, and many of them

are the accepted technical terms in present use. In the Vegas such allusions are common, but generally absurd.

In ancient Egyptian art the human figure is very defective. Quite lately, however (October, 1894), a statuette of very dark hard wood, which was discovered in the Therapeum at Karnak, has been deposited in the Louvre. It has been ascertained that it represents a priestess of Ammon, named Touïe, who lived some 3,500 years ago. The figure is that of a Nubian girl, and is exquisite in its proportions. In anatomical correctness it is equal to the famous "Crouching Scribe" in the same collection, which belonged to the fifth dynasty and is, therefore, between five and six thousand years old. It would be interesting to know the history of these rare exceptions. There was a law in ancient Thebes, it is said, by which the artist who produced a sculpture-portrait worse looking than the original was heavily fined. The temptation to beautify the latter must have been great, but the marble does not admit of as much flattery as the canvas.

In early Assyrian art the anatomy of the human figures portrayed is invariably bad, but the curious anomaly exists that sculptures of animals are frequently spirited and correct. Why the power of imitating, so excellent in the one case should so fail in the other, does not seem to admit of explanation.

It is nearly certain that Hippocrates never dissected a human body, and the extensive investigations of Aristotle were confined to animals, birds, and fishes. The practical study of human anatomy may be said to have arisen in Egypt under Ptolemy Sotor, and Herophilus and Erasistratus were permitted to dissect bodies. Their writings are lost, and it is through Galen and Celsus that their names and some notices of their work have been preserved.

To Galen must be given the great praise of having brought together all that was known in his day on anatomy, and of having added an immense number of observations of his own. Nevertheless, it is admitted by the best critics

that Galen probably never dissected a human body. His descriptions have been followed with painful minuteness by Daremberg, and the conclusion is irresistible that most, if not all, of his dissections were made upon monkeys. Galen's name was most authoritative in all matters of anatomy and physiology for many centuries, and the blind reverence of his disciples was exemplified in the reply of Silvius when being forced to admit the inaccuracy of one of Galen's descriptions, he said that "Man had changed and not for the better."

Art was far in advance of medicine. The noble works of Pheidias and his contemporaries or successors were in existence long before the time when Hippocrates began the work of rescuing medicine from the priests and made a first imperfect sketch of anatomy. For many ages after him anatomy was, in the words of a clever writer, "traditional and, in great part, fictitious; physiology little more than a farrago of crude conceits and baseless dogma; medicine a dismal combination of empiricism, superstition, and filthy charlatanism, tinged with a slight infusion of the black art."*

It is probable that the oldest anatomical drawings known to exist are to be found in a Persian manuscript. It is a treatise on anatomy by Mansour-ben-Ahmed; it is dedicated to Mirza pir Mohammed, a grandson of the famous Tamerlane, and who died in the year 800 of the Hegira, or 1406 of our era. There are six figures, of which one is a skeleton, having five false ribs on the right side and only four on the left—in verification, no doubt, of the story of the birth of Eve, for early Persian literature has frequent allusions to Moses and the writings ascribed to him. Another figure has the chest well opened, displaying the heart and lungs. This was a favorite subject for drawing with the early anatomists. The compactness, contrast of color, and importance of these organs made them especially fit to copy.

*Art in its relation to medical science. William Anderson. St. Thomas Hosp. Rep., n. s., XV, 1886, 151-181.

There is a relation of anatomy to art which is seldom referred to in didactic treatises, and that is the true delineation of deformity. Nature is never inconsistent, but is harmonious even in deformity. "For example," says Diderot, "a wry nose is natural, if it does not offend us; we are led up to the deformity by little adjacent alterations, which tone it down and belong to it. But twist the nose of the Antinous, leaving the rest of the face unchanged, and you have an unnatural effect. The Antinous will not have a wry nose, but a broken nose." An example of another kind of incongruity is to be seen in a picture by Burne Jones, where solemn faces, which remind one of Fra Angelico's "embodied ecstasies," are joined to the bodies of joyous young bathers.

The anatomical modifications produced by deformity or disease, and which are so admirably displayed in many of the paintings of the old masters, have been the subject of an able essay by the late Professor Charcot. He shows that photographs of convulsionists and hysterical epileptics strikingly recall the representations of those "possessed of devils." The earliest known drawings of an exclusively pathological character are found, strange to say, in a Japanese manuscript of the twelfth century, a copy of which is in the British Museum.* Various forms of disease of the skin are very well represented, and would seem to have been drawn from life. The most noteworthy figure is that of a man whose mouth appears to be obliterated, and who is introducing food through an aperture in the region of the stomach. A gastric fistula, the result of accident, as in the well-known case of Alexis St. Martin, or produced artificially in cases of stricture of the upper part of the alimentary tube, or for the sake of observing the process of digestion in the laboratory, is supposed to belong to the present century. So here is again an opportunity for moralizing!

Very few remains relating to anatomical art have been discovered of Roman origin. A marble figure of great in-

* Anderson.

terest was dug up in Rome in the grounds of the Villa of Musa, who was physician to the Emperor Augustus. It is a human torso, but the front of the chest and abdomen has been removed so as to expose the viscera. The heart is situated in the very center of the thorax, and is vertical in position. It exactly corresponds to the heart described by Galen, but which we know was studied on the ape. The lungs have three lobes on the left and two on the right. The chest is human, but the contents simian. It is probable that this curious figure was constructed for teaching purposes, and the crudity of the carving would correspond to the time assigned to it, long before the appearance of Galen's work.

A huge gap has to be surmounted at a bound from the time of these relics of classic art to the period when the invention of printing gave a marvelous impetus to the study of anatomy. Some of the earliest sources of illustration for anatomical teaching were *nielli*. The beautiful work known as *niello*—an Italian word equivalent to the Latin *niger*, or black—was produced by melting a black amalgam into the etchings on a metal plate, generally silver, which was afterward highly polished. The most delicate tracing that the instrument of the engraver could produce became permanently black and formed an exquisite contrast to the lustrous silver which it adorned. "Rubbings," as we should term them, were obtained from *nielli* exhibiting nude figures which were made use of by the early teachers to illustrate their lessons on the form of the human body.

With the invention of carving on wooden blocks and engraving upon copper plates anatomical drawings began to assume book form. Among the earliest of which we have any knowledge are two quaint woodcuts in the *Fasciculus Medicinae* of John Ketam, a German physician, whose work was published in 1491.

In the 14th and 15th centuries a lesson of anatomy on the cadaver was an event of such great rarity and importance that it was announced throughout the university

where it was to take place, and lords and nobles, even, were invited to be present. A curious manuscript of the 14th century, which belonged to Guy de Chauliac, a famous French surgeon, and which is preserved in the Library of the Academy of Medicine of Montpellier, gives a striking representation of such a lecture. Women, too, were present, a fact which may be comforting to some of my hearers.

The limits of this address will not permit of a detailed description of the early crude production and the gradual improvement of anatomical woodcuts and engravings. I shall come at once to the great man who first in all the ages, discarding animals, dissected the whole human body itself, and made known his discoveries by masterly plates which excite admiration to this day.

Andreas Vesal, or Vesalius, was born in 1513 or 1514, in Brussels. In his student days anatomy was taught in this wise: The professor sat in his rostrum with much dignity, reading from Galen, while his assistant, sometimes a barber surgeon, sometimes only a servant, armed with a razor, made incisions under the direction of his master. Dogs and pigs were the ordinary subjects for dissection. Human bodies were rarely obtained. Vesalius relates that he only saw three during the three years of his studies in Paris. Such an examination was almost limited to an inspection of the viscera, and there seems to have been no demonstration of the muscular system.

When Vesalius became professor of anatomy and surgery at Padua his fame as a master of human anatomy attracted students from all parts of Europe. He had early discovered that Galen's knowledge of anatomy was the result of the dissection of monkeys, which animals that writer had supposed to exactly resemble man. His bold announcement of the errors of the teacher so long held to be an infallible authority brought upon him severe animadversions from those who worshipped Galen and were, beside, jealous of the daring young innovator.

His great work was published at Basle, in 1543. It is believed that Titian undertook the illustrations, and it is cer-

tain that Titian's pupil, Jean Calcar, executed the larger number of them.

Passing by without comment many works on anatomy, more or less artistic, which were composed after the example of Vesalius, I come to the masterpiece of the 17th century.

The finest work of art in the shape of anatomical copper-plate engraving ever produced is the superb folio of Godfrey Bidloo, published at Amsterdam in 1685. The drawings were made for him by the artist Gerard de Lairese, and the engraving is worthy of the artist and the professor. Lairese confined himself to a close delineation of his subject, but a little of the old-time fancifulness is occasionally apparent, especially in two plates which are introductions to the osteology. In one of these a superb skeleton has just stepped out of a massive sarcophagus and holds aloft an hourglass with the air of one who discourses on the brevity of life. In the second plate the grim moralist is returning to his grave with a sardonic smile, as if he preferred his peaceful rest to the turbulent outside.

And here is a convenient place to draw attention to the humorous displays of the early anatomists. Representations of the bony emblem of mortality in fantastic positions or relations appear in quite ancient literature. The presence of such a lugubrious guest at a feast or in places devoted to pleasure is a curious usage derived, according to Herodotus, from the Egyptians. The expression "a skeleton at the feast" is proverbial, but it is inaccurate as regards its source. The word *skeletos*, in its original usage, meant a dead body—a dried-up corpse, a mummy—and it is most likely that at the feasts of the ancient Egyptians a mummy served as the *memento mori*. In the museum of the Vatican is a marble thorax which exhibits the ribs only, but very finely proportioned. It is thought that this was intended to serve a similar purpose.

There was much sardonic humor in the old anatomists. In Valverde's work is to be seen an *écorché* who holds a knife in one hand, and with the other holds up the entire

skin of his body, which he gazes upon with looks of affectionate admiration.

A skeleton moralizing, Hamlet fashion, over a skull is one of the drawings of Vesalius, who died in 1564, the very year of Shakespeare's birth.

The work of Charles Estienne, better known under his Latinized name of Stephanus, was published in 1545. It is a curious attempt to conjoin art and anatomy, generally in a fantastic manner. For example, the first of the plates illustrating the anatomy of the brain contains a kneeling figure supporting himself by a staff and obligingly presenting his cranium for inspection. The scalp, which has been removed, is hanging on the branch of a tree, and upon another tree is suspended a framed table with the necessary description. In the next plate the skull-cap is hanging on the tree, and the surface of the brain is presented to view. Each following plate has a different landscape, and as section after section of the brain has been removed, the benevolent cadaver places himself in the most convenient position for the full enjoyment of the spectacle he offers. In the last plate, when all the brain has been taken away, half kneeling, half lying, but courteous to the last, he presents the bony base of his cranium to show that all is gone. The landscape is sympathetically conceived. The shattered trunk of a tree is near the figure and a ruined castle in the background.

In Laurentius' Anatomy, published in 1595, the climax of absurdity is reached, for a professor, demonstrating the anatomy of a body which lies before him, has the entire front of his own chest removed and thrown over his right shoulder, so as to exhibit the heart and lungs for the edification of his class.

In one of the earliest illustrated books produced after the invention of printing, the famous Nuremberg Chronicle, published in 1493, there is a plate entitled *Imago Mortis*, the Image of Death. A manikin is playing on a flute while two skeletons and an *écorché* are dancing. The invention of the manikin is ascribed to Fra Bartolomeo.

This fantastic taste was common in the period of what has been called the paganism of the Italian Renaissance. Everything was paganized. Christian names were converted into Latin. God, Christ, the Virgin, the angels, were described in the writings of the day under names which had belonged to the "kind old gods" of Olympus. Sanazaro in his poem *De partu Virginis* not only invokes the muses of Helicon to celebrate the birth of Christ, but introduces the old pagan river-god Proteus, who announces the forthcoming event to the river-god of Jordan.

In the quaint compositions known as the Dance of Death this peculiar humor, always associated with the moral lesson of the uncertainty of life, is curiously exhibited. There is a charming composition of Le Sueur which embodies the same moral. A young Epicurean, richly dressed, crowned with flowers, and brilliant with health, promenading through a delicious landscape, sees a tomb on which is the inscription *Ipse Epicurus obiit*—even Epicurus died.

The attempt to teach artistic anatomy by models began at a very early period. The most usual form was a figure from which the entire skin and underlying cellular tissue had been removed, so as to exhibit all the superficial muscles of the body. It was carved in marble or molded in plaster. We have no English word for it except the clumsy term of "flayed figure," so we still use the French word *écorché*. These figures generally suggest the flaccid muscles of the dissecting table. *Écorchés* were made by Bandinelli, a contemporary of Michelangelo, by Tortébat, Bouchardon, Houdon, Salvage, and others. The figure most commonly seen in studios is the composition of Houdon. Alphonse Lami, a French statuary, about forty years since produced a new and very admirable one. It was a life-size figure known as *Le bêcheur*, and represented a man digging with a long-handled spade. Lami's theory was to represent "a living man without his skin in a given action." Another very excellent *écorché* was made later by a young artist named Eugène Caudron.

Attempts have not been wanting to improve the melancholy lay-figure of the studio. An ingenious method has lately been put forth by Dr. Eliza Mosher, which she calls a "posture model." The vertebrae of an articulated skeleton are strung upon a lead pipe, through which runs a copper wire, to modify its flexibility. The spinal column thus prepared can be curved to represent any position of the body desired.

It is told of a famous artist that upon entering his studio and finding his pupils busily engaged in drawing from an *écorché*, he flung the plaster cast into the fireplace, saying, "If you want to paint muscles, look at the living figure with the skin on!" And yet the living model has its disappointments. How little there is of the heroic in the tired arm of the supposed warrior! Sir Charles Bell said that ropes are wanted to hold the model up while the picture is completed, and in Cheselden's Anatomy there is a plate of an *écorché* tied with ropes to the branches of a tree, to keep him in the position needed to show his muscles.

A subject in which anatomy is, to some extent, concerned is the much disputed one of idealism and transcendentalism in art. Cicero said that more beautiful images could be conceived in the mind than are seen by the eye, and a modern poet, in like vein, says:

"No true painter ever set on canvas
All the glorious visions he conceived."

But no painter's pencil or poet's thought can do more than combine the visible and the remembered. The poet invented and the artist painted centaurs, fauns, satyrs, mermaids, and other fantastic creatures, but they were only combinations of the human with animal form. Marvelous skill was shown in giving the expression of the animal to the partially human face. It is not the pointed ears, the budding horns, and goat's legs alone which make the sylvan deity, but the leering sensuality of the goatish face, inimitable as it seems to be by modern art, is the characteristic of Pan and his cohort.

Sir Joshua Reynolds, in a strong passage denying the possibility of anything superhuman in art, ends thus: "We are forced to confine our conceptions, even of heaven itself and its inhabitants, to what we see in this world." He might have added that the inventions of Christian art may take rank in their absurdity with the grotesque monsters of classic lore.

Ideal beauty on theoretic grounds reminds one of the endless geometric schemes of human proportion. They produce an exact and symmetrical result, but as lifeless and uninspiring as a composite photograph. The Grecian sculptor, ignorant of dissection, was master of the anatomy of form. He sought to attain the highest ideal beauty not by any fanciful theory, but by selecting the most perfect type of every feature or limb.

The story may not be true that "the statue which enchants the world" was really composed from "the mingled beauties of exulting Greece," but the principle involved is unquestionably correct. The sculptor Rinehart stated to a friend that his *Clytie* was the result of a study of twenty of the finest models in Rome.

It is told of a young painter that before beginning to work he knelt down and prayed to be delivered from his model. His aim was to idealize, not to copy. And with the highest success of the artist in embodying his ideal comes to the beholder, after long gazing, an uneasy feeling of desire for something still loftier. "The loveliest Madonnas of Christian art," said Ruskin, "fall short of their due power if they do not make their beholders sick at heart to see the living Virgin."

There are some famous pictures which represent the teaching of anatomy, and in these the obligations of anatomy and art may be fairly considered to be reciprocal.

Few persons can have visited The Hague without seeing and admiring Rembrandt's painting of "The lesson of anatomy." It represents Professor Tulp, the friend and protector of the artist, demonstrating the muscles of the forearm before

his class. The bright, intelligent faces of his auditors, the easy grace of the master, who with one hand is lifting the tendons and with the other is impressing upon his hearers the functions of the muscles, is a masterpiece of expression. Tulp's name is hardly known now except to the student, but he will live in history as long as Rembrandt's painting shall endure. It is not generally known that there is in existence a still finer painting by Rembrandt of a like subject. The Tulp picture was produced when the artist was twenty years old. In his fiftieth year he painted a Lesson of Anatomy as given by Professor Deyman. This was lost sight of for a very long period, and it was only recently that it was discovered in London and secured for the Royal Museum of Amsterdam. Unfortunately a large part of the painting had been destroyed by fire, and of the class only one figure remains, that of a youth with a fine face, dressed in the sombre garment set off by a long white collar characteristic of the period. He holds the skull-cap of the subject in his hand. Of the professor nothing is left but the hands, which are extremely beautiful, and which hold two instruments in true surgical style, with which the membranes of the brain are being demonstrated. The cadaver is in a half sitting position for the convenience of the lecturer, and there is in the face and attitude something of that grim half-consciousness which the older anatomists delighted to represent. The body is foreshortened with daring skill, and what is left of this wonderful painting shows the great advancement which time had brought to the skill of the master. This fragmentary painting was discovered by Volkmaier, the biographer of the artist, who knew of its existence from Rembrandt's papers. I have seen only one notice of it in print.*

In the Royal Museum of Amsterdam a room has been dedicated to a collection of paintings of "Lessons of Anatomy," by Dutch artists, extending from 1603 to 1758. This

* Paul Triaire. *Les leçons d'anatomie et les peintres hollandais aux xvi^e et xvii^e siècles*, [Paris] 1881.

fragment of Rembrandt's is the especial treasure of the collection. There are in all nine of these paintings.

After this partial retrospect of the progress of artistic anatomy, and of the methods by which it has been taught, our first question occurs—Did anatomy aid early art?

Early Greek art was most likely prehistoric. It has been surmised, and the surmise repeated as if it were a settled discovery, that it was during the Homeric period that the Venus of Melos, of the Medici, the Laocoon, the Niobe, and other masterpieces were produced. All this is very uncertain and very unimportant. It is sufficient for the present purpose to know that the age of Pheidias long preceded the first crude attempts to study human anatomy on dogs, pigs, and monkeys. If by anatomy be meant dissection, the question then answers itself. External form was seen in its perfection in the sunny climate of Greece. The open-air life, the free garments, the games of the arena, all tended to this end. Other things conspired to make the age of Pheidias especially favorable for the development of art. The gorgeous spoils of the defeated Persians supplied stores of gold and ivory for the chryselephantine statues, and the continued tribute for defense from the Grecian States under the rigorous rule of Pericles furnished ample resources for architectural and artistic work. Athens had been destroyed, and new temples and buildings were to be erected. These demanded the highest efforts of plastic art, whether in full or in semi-relief, for their adornment. It must not be supposed that Pheidias trusted only to his marvelous genius. He was early trained in the school of Hegias, and later with his famous fellow-pupils, Myron and Polykleitos, in the school of the Argive sculptor, Ageladas.

Another potent cause for the supremacy of art in that time was the intense love of beauty inherent in the Greek. "I take the gods to witness," are the words put in the mouth of a Grecian youth, "that I would rather have a fair body than a kingly crown."

It is to be observed that the male figure predominates in

Greek art. Winckelmann, of whom Madame de Staël said that he made himself pagan for the purpose of penetrating antiquity, says: "As it is confessedly the beauty of man which is to be conceived under the general idea, so I have observed that those who are observant of beauty only in women, and are moved little or not at all by the beauty of men, seldom have an impartial, vital, inborn instinct for beauty in art. To such persons the beauty of Greek art will ever seem wanting because its supreme beauty is rather male than female."

Winckelmann does not enter into the reasons for this preference for masculine figures, but the opportunity for superior development of the muscles, especially in martial or athletic postures, naturally explains it. The beauty of goddess or nymph in the marble fills the mind with admiration, but it is of a calm and placid nature. "Greek sensuousness," says Pater, "does not fever the blood. It is shameless and childlike." To the Greek artist external form, in motion or in repose, was all the anatomy he could acquire or need. He found that "acuteness and fidelity of eye and obedience of hand brought precision; precision, proportion; proportion, beauty."*

How many theories upon the nature of the beautiful have been written! From Longinus to Ruskin and Spencer, where are now their followers? Who does not feel forced to say with Omar Khayyám :

"I have heard great argument
About it and about; but evermore
Came out by the same door where in I went."

There are certain qualities which, from the anatomist's point of view, are essential to beauty of form. The skeleton, the foundation of the figure, though unseen, must be perfect, the long bones arched, and the joints not clumsy. The muscular system must be well developed in both sexes. Fat in moderation contributes to the roundness of outline, though its excess is fatal to ideal beauty. Last of all, the

* Fuseli.

skin, with its concomitants of color and hair, becomes the quintessence of form in its wonderful capacity of expression. A hundred years ago Diderot, the ablest art critic of his century, said: "A thousand painters have died without having comprehended flesh; a thousand others will die without comprehending it."

The glorious period of Grecian art is, to us, emphatically the age of sculpture. That it was equally famous for its paintings we know from history, but they have all long since perished. A beautiful specimen of what is thought to be a painting of those early days was discovered at Cortona. The peasant who dug it up had used the slab as a door to his oven. The painting consisted of an exquisite female face of the purest Grecian type. An enthusiastic critic, after dilating on its beauties, says: "It is a pagan face, and the Christian soul has never dawned in those eyes." What the particular expression of the "Christian soul dawning in the eyes" may be he prudently leaves unexplained. It was a touch beyond the reach of common sense.

Leaving the consideration of the period of the masterpieces of Grecian sculpture, let us briefly consider what anatomy did for art at the time of the Italian Renaissance. Four names present themselves especially in this connection.

Luca Signorelli (1442-1524) exhibited a remarkable knowledge of anatomy, from which it is known that Michelangelo greatly profited. Luca painted a noble picture representing a man carrying a dead youth on his shoulders. Both figures were nude, and it is probable that the painting was made in a lazaret-house, for at that time the hospital, the gallows, and the churchyard were the only schools of anatomy, or it may have had some allusion to a touching incident of Luca's life. He had a favorite son, an extremely beautiful youth, who was one day brought home dead, having been slain in a duel. Luca carried him into his studio, removed the clothing, and tenderly washed the blood stains from the beautiful body. He arranged the light, and, with dry eyes and firm lips, remained hour after hour painting on his can-

was the lovely youth, so ruthlessly torn away, before decay should touch him. There is no doubt of the authenticity of this story, but it is remarkable that in a Latin poem by Vincent Bourne a like action is attributed to Apelles. It is probable, however, that the name is used generically for a painter, and that the incident referred to is the one just related. Cowper has translated the poem. One knows not which to marvel at the most, the devotion of the artist or the stoicism of the father.

The exquisite taste of Leonardo da Vinci, the great predecessor of Michelangelo and Raphael, saved him from any obtrusive display of his knowledge of anatomy, which was, perhaps, unequalled in his day. The anatomical sketches by this master still preserved at Venice are masterly drawings of great accuracy.

How Michelangelo obtained the knowledge of anatomy which he employed with such wonderful effect we do not know. His sketches of the partially dissected body and of the skeleton are often incorrect, and it is probable that he trusted to his memory of what he had seen in the hospitals or graveyards. He rarely introduces any portion of landscape. The human form was all to him. In one of his sonnets to Victoria Colonna he says:

“Nor hath God deigned to show himself elsewhere
More clearly than in human forms sublime;
Which, since they image him, compels my love.”

(Symonds' translation.)

It is an old saying “*Ars est celare artem*,” It is art to conceal art. Anatomy should not be learnt to parade it. The muscles in some of Michelangelo's figures are so enormously developed as to seem distorted. Quatremère de Quincy says of him that while he made his figures show the very life of motion as no other artist ever has done, none of them seem to be capable of thought or feeling. Physical strength in perfection in every posture there was, but a sombre expression of face characterized them all. While there is some ground for this criticism, it is too general when applied to

all the works of this mightiest of the great masters. A fine illustration to the contrary is to be found in his famous Pietà. There is the Madonna with the dead Christ on her knees. Her small head, youthful face, large torso, and ample limbs are illustrations of Michelangelo's conception of the heroic. The pathetic stillness and beauty of the relaxed dead body and the contrast to the vigorous form of the mother, with unspeakable woe in her face, is beyond description.

It would be a juster criticism to say that he was wanting in the especial characteristics of the art of Pheidias, simplicity and grace, or as Winckelmann admirably termed it, "noble *naïveté* and placid grandeur."

Probably the most striking example of Michelangelo's knowledge of anatomy was displayed in the famous cartoon which he produced in rivalry with Leonardo da Vinci. He selected as its subject an incident of the war between the Florentines and the Pisans. A number of Florentine soldiers were bathing in the Arno when an alarm was sounded betokening the approach of the enemy. The men are seen rushing from the river to the bank and making desperate efforts to put on their clothing and armor. The muscles of the warriors are superbly displayed and are free from the exaggeration which is seen in some of Michelangelo's colossal figures. The cartoon perished, but a copy fortunately survives of what, perhaps, was only a portion of the original drawing.

The anatomical sketches of Raphael which are yet in existence show mostly, as might be expected, a masterly knowledge of external form. There is little of the robust musculature of his great contemporary in his works, but it is generally correct.

As we leave the fascinating period of the Renaissance we come to the time when it was no longer necessary to study anatomy by stealth at the gallows foot or in the lazar-house. Time will not permit of an attempt to trace the effect of such studies further. Brief and discursive as this sketch has been, I shall venture to suggest certain conclusions from it.

That neither in ancient Egypt, the Orient, nor in ancient Greece did art obtain any assistance from human anatomy by dissection. That nevertheless the finest examples of sculpture of the human figure that the world has ever seen were produced in ancient Greece.

That not until about the sixteenth century were such studies made possible, and that not until the time of Vesalius was there any thorough knowledge of human anatomy.

That an acquaintance with muscular anatomy by dissection, though to be recommended as useful, forms but a comparatively unimportant part of artistic anatomy. That this latter must be the study of the external form of the living body in repose or in motion, with a profound observance of the modifications produced by sex, age, and race.

That, in short, physiology, and to some extent external pathology, meaning by this latter term the effect of disease, wounds, and death upon the body, with a certain amount of study of the muscles by dissection, make up what should be understood by artistic anatomy, or, as I should prefer to term it, artistic morphology.

